

170/135.23

244-13

BRITISH

11,754<sup>10</sup> OF May 11 1909

A.D. 1909. MAY 11. N° 11,754<sup>10</sup>.

GEOGHEGAN & another's COMPLETE SPECIFICATION.

SHEET 1.

416  
135

244-13

Reinforcers  
C<sup>1</sup> Buffer

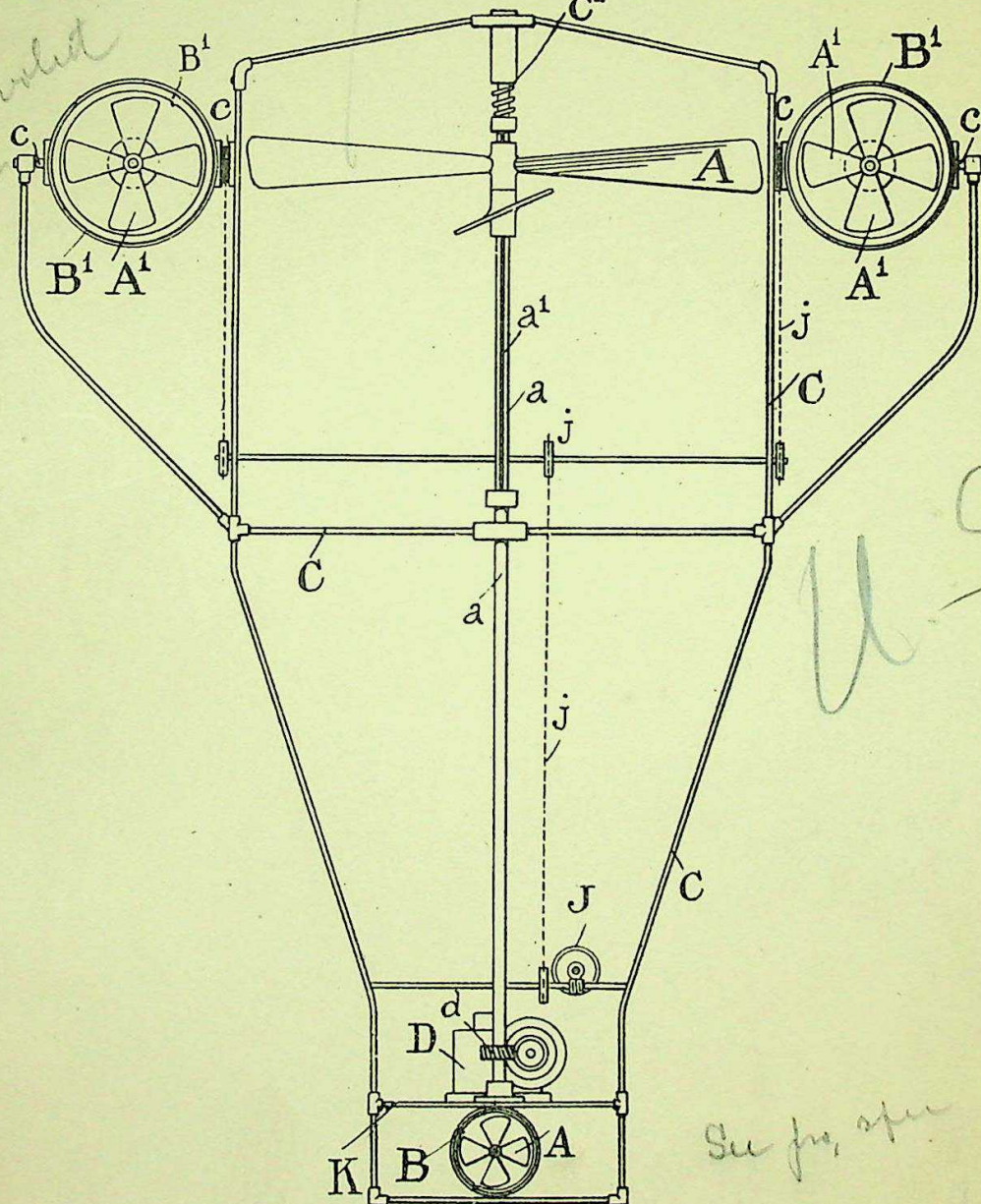


Fig. 1.

See Geoghegan

See for spec  
Pr. 11,090  
1909  
not  
N.3



A.D. 1909. MAY 11. N<sup>o</sup> 11,754<sup>10</sup>

GEOGHEGAN & another's COMPLETE SPECIFICATION.

SHEET 3

244-13  
May 11/10

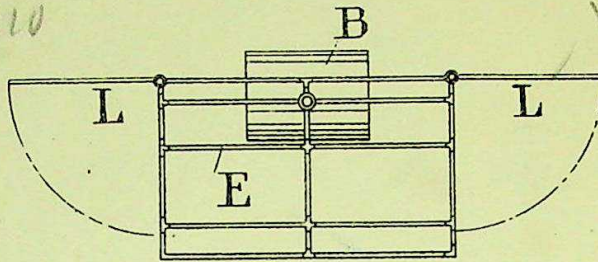


Fig. 11.

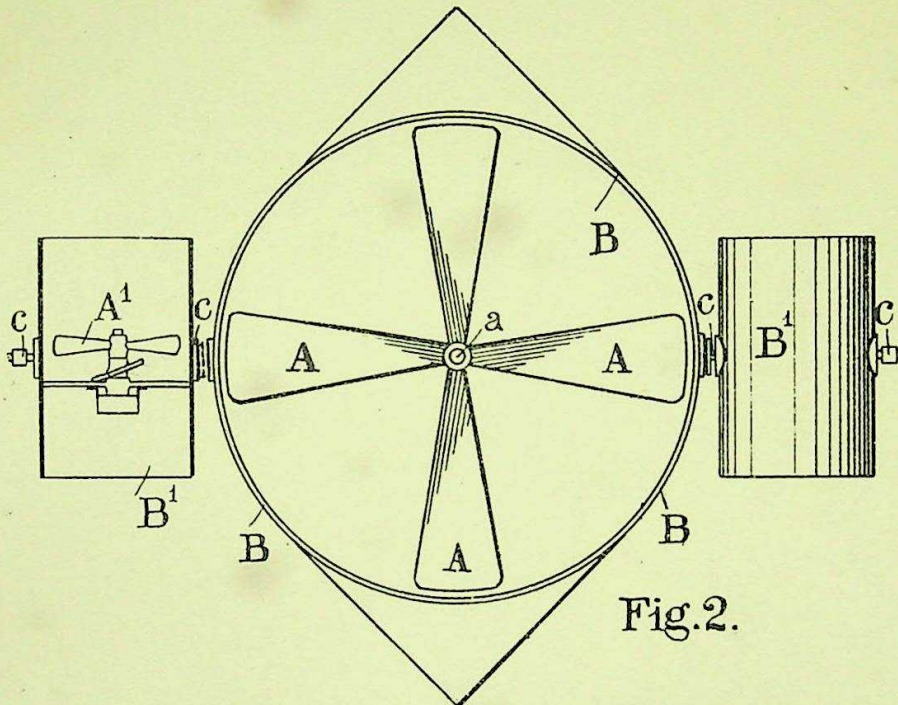


Fig. 2.

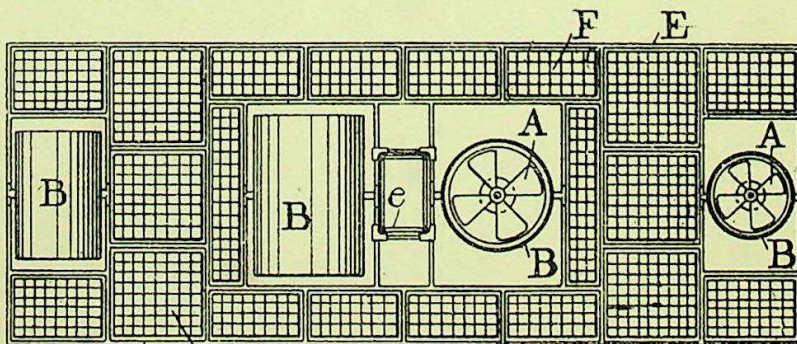
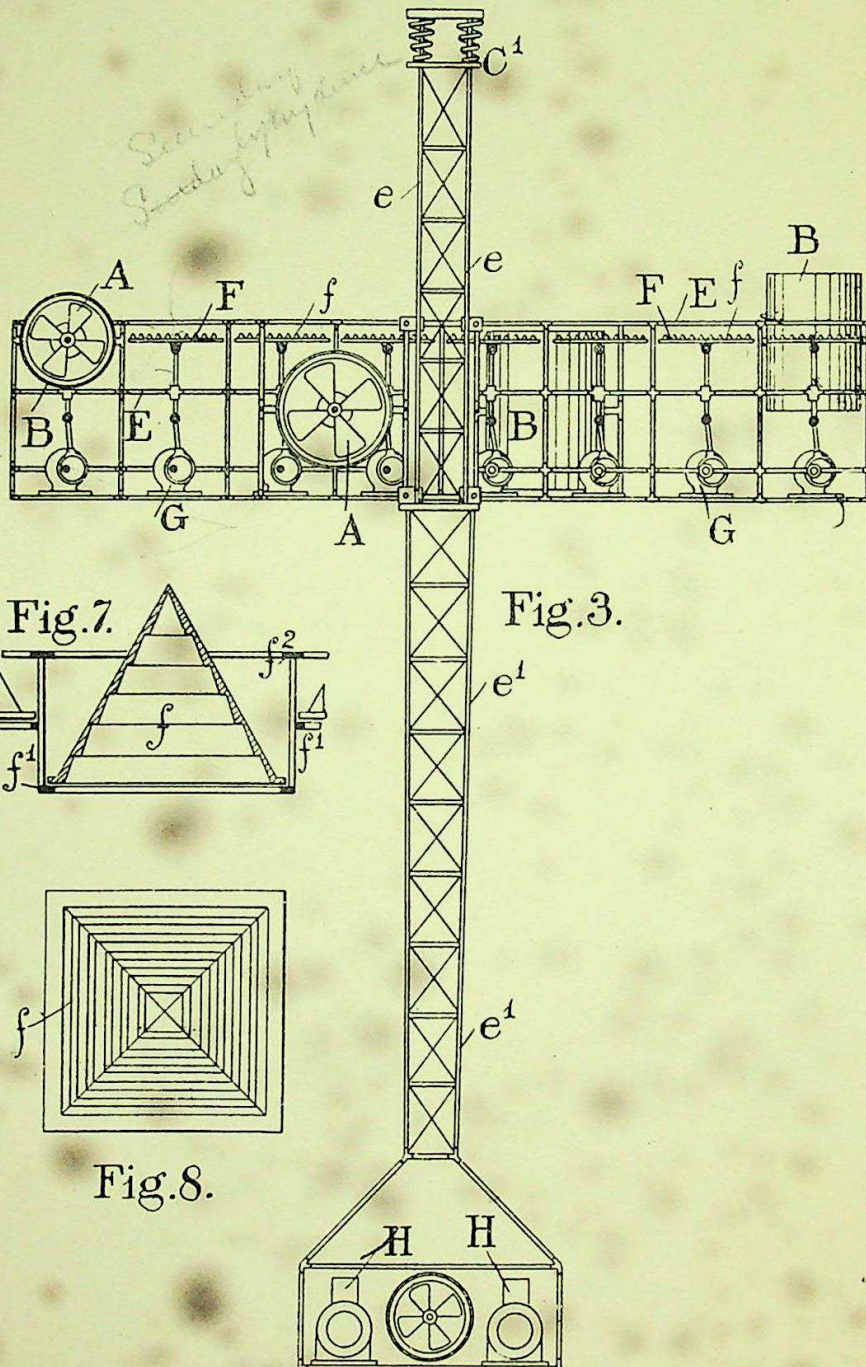


Fig. 4.

Provisional drawing in 244-13







[This Drawing is a reproduction of the Original on a reduced scale.]

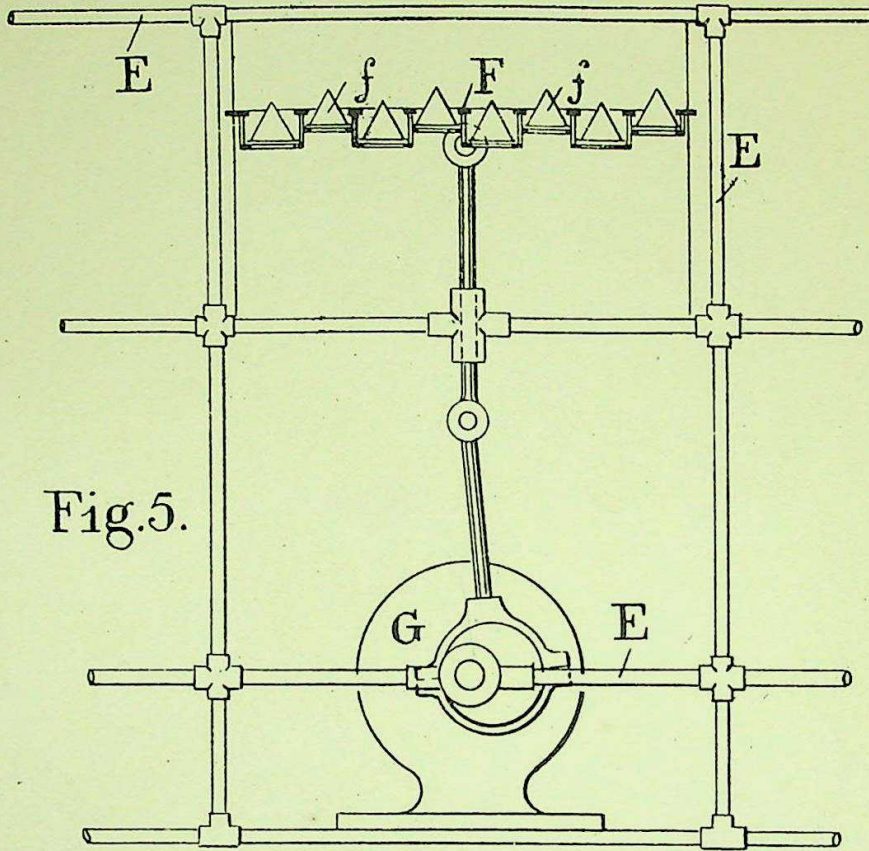


Fig. 5.

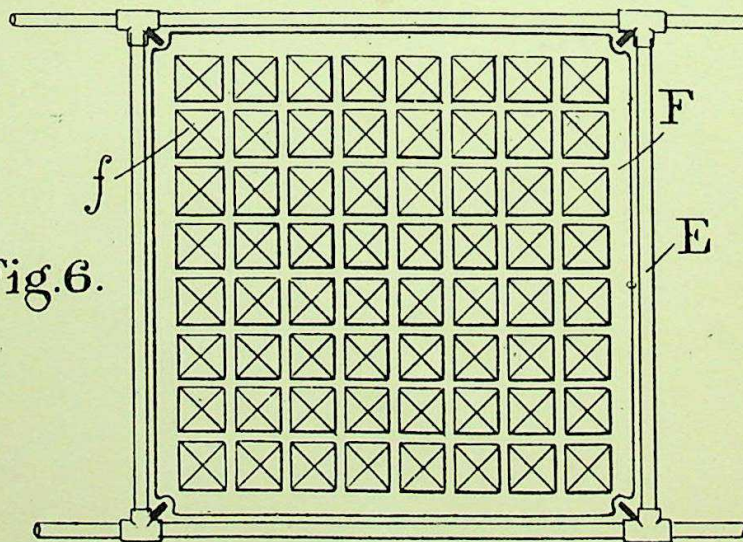


Fig. 6.



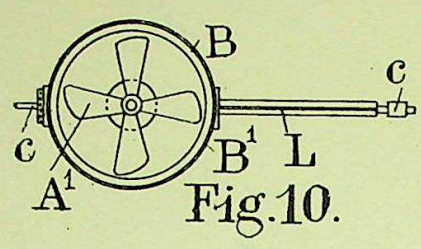


Fig. 10.

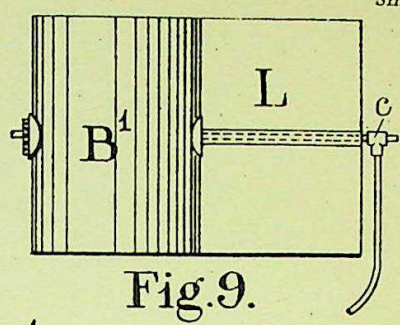


Fig. 9.

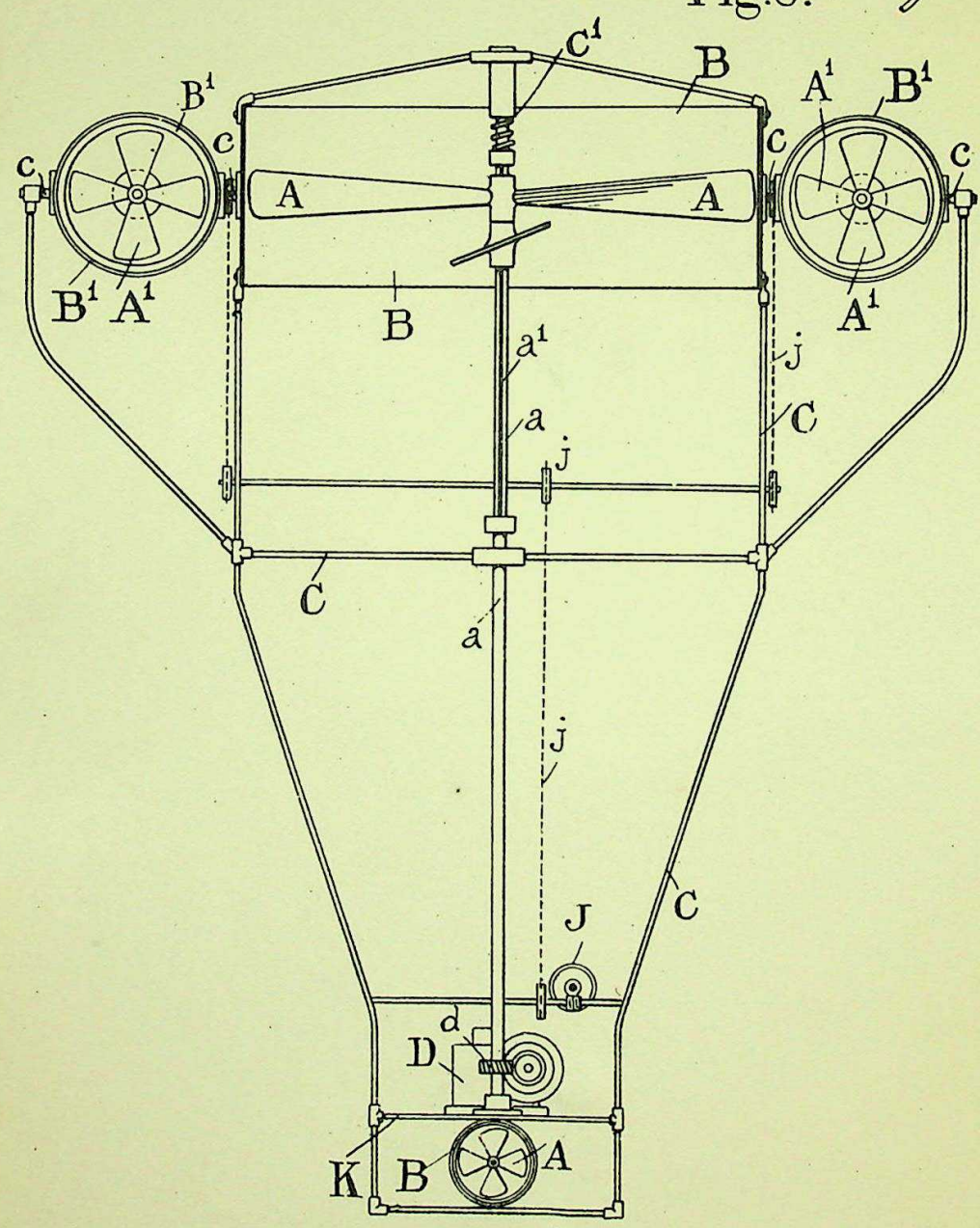


Fig. 2a.

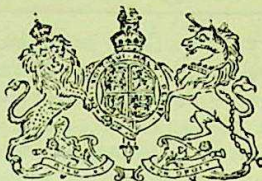
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[This Drawing is a reproduction of the Original on a reduced scale.]



N<sup>o</sup> 11,754



A.D. 1910

Duplicate

Date of Application, 11th May, 1909

Complete Specification Left, 11th Nov., 1909—Accepted, 11th Aug., 1910

PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Aerial Navigation.

We, EDWARD ARTHUR GEOGHEGAN, of Cross Street, Manchester, in the County of Lancaster, Engineer, and GEORGE MATTHEWS LINDSAY MOORE-IRVINE, of the same address, Major, retired, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to improvements in apparatus for aerial navigation and is designed to provide an improved means for accomplishing same.

It consists essentially of one or more lifting screws or propellers mounted so as to slide vertically on the driving shaft or shafts so that when motion is first imparted to a screw it slides upwards on its shaft only having to lift its own weight and subsequently taking the whole weight of the apparatus only when it is rotating at good speed and has slid to the top of the shaft, with or without supplementary lifting means also preferably capable at the commencement of motion of sliding vertically on vertical support or supports consisting of a series of air valves mounted in a suitable frame work and adapted to be reciprocated vertically, said valves offering little resistance to the air on the upward movement but offering full resistance to it when moving downwards, and one or more screws or propellers for propelling, and manoeuvring the apparatus preferably arranged in or at the ends of preferably rifled cylinders normally arranged horizontally but which are mounted on pivots or swivels so that they may be directed in any way desired for manoeuvring or to assist the lifting effort.

In the simplest form of the invention a screw propeller of large diameter which may be mounted in a tubular casing which may be rifled on its inner walls, is made to revolve by means of a vertical shaft on which is fixed a feathered key, and the boss, hub or centre piece of the screw propeller is arranged to have a vertically free motion or movement on the vertical shaft so that when first put in rotary motion it will slide vertically upwards upon the shaft its vertical ascent being in no way retarded and the only resistance to overcome being the mere weight of the propeller itself. The ascending or vertical velocity is thus considerable before the weight of the main structure acts on the revolving propeller. A spring or other buffer is preferably arranged at the top of the shaft against which the propeller engages as it rises preferably in such a manner that it takes the weight of the apparatus gradually.

From the tubular casing which contains the propeller or from the frame carrying the upper end of the shaft depend rigid or flexible stays or supports to which are fixed the car or platform. Upon the car or platform is arranged the main motive power generator. The power generator may be of any type and motion may be transmitted to the propeller direct through suitable gearing or the power generator may be employed to drive a dynamo and an electric motor may be arranged to drive the propeller.

To the frame or a tubular casing may be attached preferably at opposite points

[Price 8d.]



*Improvements in Apparatus for Aerial Navigation.*

on its outer side secondary propellers mounted on pivots used for forward and backward or ahead and astern motion or progress, and for ascending and descending in diagonal or oblique directions, and for reversing, steering, and circling or manoeuvring purposes, or to assist the lifting effort.

The distance from the main tubular casing to platform or car containing motive power and generating machinery is preferably slightly greater than the greatest diameter of the frame or tubular casing and the weight of the motive power generating machinery and platform is preferably in excess of that of the remainder of the structure, so that absolute, positive and automatic balance is secured.

The speed or velocity of the main screw air propeller may be regulated by a friction clutch but where the propeller is driven by an electric motor which is preferable it is regulated by means of a variable speed controlling switch.

One or more such lifting units may be adapted to support and be driven from one car or platform.

In a modified arrangement two or more lifting propellers as above described mounted in a suitable framework supported from the car on one or more vertical supports, the whole framework being made capable of lifting thereon when motion is first imparted thereto in the manner above described. Such framework may take the form of a plane and some or all of the propellers may be made to swivel so as to aid in driving the apparatus forward when it has been lifted sufficiently high above the ground.

Or the plane may be an open framework divided into sections each section being provided with a plate or grid capable of receiving vertical reciprocatory movement, the plate being formed with a number of air valves adapted when the plate is lifted to allow the air to pass downwards through it freely, but when it is lowered to close and press on the air to lift the apparatus or assist in lifting it.

In such arrangement the screws and air valve arrangement may be employed together to raise the apparatus and when it is raised the screws may be employed for forward and backward motion and manoeuvring or the like and the air valve arrangement for lifting or supporting in the air. Or the air valve arrangement may be alone employed for lifting and the screws for forward motion and the like.

Or the air valve frame may be independent of the lifting screws and arranged above same, the latter being mounted separately or in a separate frame below the air valve frame or *vice versa*.

One, two or a number of propellers in rifled tubes as before mentioned may also be fixed to the middle, or bottom or outer sides of the platform or car which contains the main motive power machinery and the steering and ascent, or descent and direction may be secured or altered by varying the speed of this screw or screws, and these or any of them may be also fixed in rifled tubes which in turn may be fixed on swivels or pivots.

Dated this 10th day of May, 1909.

J. OWDEN O'BRIEN,

Successor to and late of W. P. Thompson & Co., of Manchester,  
Patent Agents.

## COMPLETE SPECIFICATION.

*Improvements in Apparatus for Aerial Navigation.*

We, EDWARD ARTHUR GEOGHEGAN, of Cross Street, Manchester, in the County of Lancaster, Engineer, and GEORGE MATTHEWS LINDSAY MOORE-IRVINE, of the same address, Major, retired, do hereby declare the nature of this invention



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and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to improvements in apparatus for aerial navigation and is designed to provide an improved means for accomplishing same.

- 5 It consists essentially of one or more lifting screws or propellers mounted so as to slide vertically on the driving shaft or shafts so that when motion is first imparted to a screw it slides upwards on its shaft only having to lift its own weight and subsequently taking the whole weight of the apparatus only when it is rotating at good speed and has slid to the top of the shaft, with or  
10 without supplementary lifting means also preferably capable at the commencement of motion of sliding vertically on vertical support or supports consisting of a series of air valves mounted in a suitable frame work and adapted to be reciprocated vertically, said valves offering little resistance to the air on the upward movement but offering full resistance to it when moving downwards,  
15 and one or more screws or propellers for propelling, and manoeuvring the apparatus preferably arranged in or at the ends of preferably rifled cylinders normally arranged horizontally but which are mounted on pivots or swivels so that they may be directed in any way desired for manoeuvring or to assist the lifting effort.

- 20 The invention will be described with reference to the accompanying drawings.

Figure 1. Sectional side view of a simple form of the invention.

Figure 2. Plan of same partly in section.

Figure 2<sup>a</sup>. Is a similar view to Figure 1, showing the propeller rotating in a tube.

- 25 Figure 3. Sectional side view of machine showing compound arrangement of lifting screws and reciprocating valves.

Figure 4. Plan of same.

Figure 5. Side view to a larger scale of one section of the subsidiary lifting valves.

- 30 Figure 6. Plan of same.

Figure 7. Sectional elevation of a single air valve.

Figure 8. Underside plan of same.

Figures 9 and 10. Detail views showing the application of planes to the arrangement shown in Figures 1 and 2.

- 35 Figure 11. End view of machine shown in Figures 3 and 4 with planes applied thereto.

In a simple form of the invention (see Figures 1 and 2) a screw propeller A of large diameter is mounted to rotate horizontally on a vertical shaft *a*. The shaft *a* is provided with one or more feathers or key ways *a*<sup>1</sup> as shown, and the  
40 boss hub or centre piece of the propeller A is provided with corresponding key ways, keys or the like, but is made so that it will slide freely longitudinally of the shaft *a* in such a manner that when first put in rotary motion it will slide vertically upwards upon the shaft *a*, its vertical ascent being in no way retarded, and the only resistance to overcome being the mere weight of the propeller A  
45 itself. The ascending or vertical velocity is thus considerable before the weight of the main structure acts on the revolving propeller. A spring or other buffer C<sup>1</sup> is arranged at the top of the shaft *a* against which the propeller A engages as it rises preferably in such a manner that it takes the weight of the apparatus gradually.

- 50 The propeller may if desired be arranged to rotate in or at the back of a tubular casing B as shown in Figure 2<sup>a</sup> and this casing may extend the whole length of that portion of the shaft *a* upon which the propeller slides, or, as shown it may be comparatively short and only surround the upper portion of the shaft at that portion where the propeller rotates when supporting the machine in the air.

- 55 Such tubular casing may be rifled if desired.

The upper end of the shaft *a* is carried or supported by stays or supports C, to which is fixed the car or platform K. Upon the car or platform K is arranged



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the main motive power generator D. The power generator may be of any type and motion may be transmitted to the propeller direct through suitable gearing *d*, or the power generator may be employed to drive a dynamo and an electric motor directly coupled thereto may be arranged to drive the propeller.

To the stays or supports C or to the tubular casing B where such is employed 5 are attached preferably at opposite points on its outer side propellers A<sup>1</sup> which are used for forward and backward or ahead and astern motion or progress, and for ascending and descending in diagonal or oblique directions, and for reversing, steering, and circling or manœuvring purposes, or to assist the lifting effort. 10 These propellers rotate in tubes as above described.

The tubes B<sup>1</sup> containing the propellers A<sup>1</sup> may be varied in position about the pivots *c* in any suitable manner, for instance a hand wheel J on the car K adapted through a suitable system of chains, and chain wheels *j* to rotate the tubes may be employed for this purpose.

These propellers may be driven in any suitable manner. 15

One or more such lifting units may be adapted to support and be driven from one car or platform.

In a modified arrangement two or more lifting propellers as above described may be mounted in a suitable framework supported from the car on one or more vertical supports the whole framework being made capable of lifting thereon 20 when motion is first imparted thereto in the manner above described. Such framework may take the form of a plane and some or all of the propellers may be made to swivel so as to aid in driving the apparatus forward when it has been lifted sufficiently high above the ground.

An arrangement with a secondary lifting and supporting device is shown in 25 Figures 3 and 4 of the drawings. In this arrangement the plane consists of an open framework E divided into sections each section being provided with a plate or grid F, capable of receiving vertical reciprocatory movement. The plate F is formed with a number of air valves *f* adapted when the plate is lifted to allow the air to pass downwards between or through them freely, but when it is lowered 30 to close and press on the air to lift the apparatus or assist propellers A and A<sup>1</sup> in lifting it.

In such an arrangement the propellers A, which are pivoted and made adjustable in the same manner as the subsidiary propellers A<sup>1</sup> shown in Figures 1 and 2 and the air valve arrangement may be employed together to raise the 35 apparatus and when it is raised the screws may be employed for forward and backward motion and manœuvring or the like and the air valve arrangement for lifting or supporting the machine in the air or the air valve arrangement may be alone employed for lifting and the screws for forward motion and the like.

We are aware that it has been proposed to employ vertically reciprocating 40 means containing air valves to support and raise apparatus in the air and to such broadly we make no claim herein.

Or the air valve frame may be independent of the lifting screws and arranged above same, the latter being mounted separately or in a separate frame below the air valve frame or *vice versa*.

The whole of the subsidiary lifting device carried by the frame E is adapted 45 to rise upon the stay or stays, support or supports carrying the car before taking the weight thereof together with the propellers A as described with reference to Figures 1 and 2.

For this purpose the frame E is constructed so that it can slide vertically upon 50 the upper end *e* of the stay or support *e*<sup>1</sup> carrying the car K and a spring or other device C<sup>1</sup> as described with reference to Figures 1 and 2 is provided so that the weight of the car is taken up gradually by the lifting arrangements.

One, two or a number of the propellers A as before described may also be fixed 55 to the middle, or bottom or outer sides of the platform or car which contains the main motive power machinery of any of the forms of the apparatus described, and the steering and ascent, or descent and direction may be secured or altered



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by varying the speed of this screw or screws, and these or any of them may be also fixed in tubes B which in turn may be fixed on swivels or pivots.

Figures 5 to 11 of the drawings illustrate details of the apparatus shown in Figures 3 and 4 which are described at length in the Specification of our concurrent Application No. 11,090 of 1909.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In apparatus for aerial navigation, mechanism for lifting, travelling, steering, or other purposes mounted so as to be capable of sliding longitudinally upon its bearing surface so that when motion is first imparted to it it slides longitudinally upon its bearing at first having to move its own weight alone, and only subsequently taking the whole or its proportional weight of the apparatus substantially as described.
2. Apparatus of the type described in Claim 1 comprising a revolving screw propeller capable of sliding longitudinally upon its driving shaft substantially as described.
3. Apparatus of the type described in Claim 1 comprising a vertically reciprocating air valve arrangement with or without supplementary screw propellers the frame of which is made capable of sliding on the car stay or support substantially as described.
4. In means for lifting travelling and steering aerial apparatus of the type described in Claims 1 to 3 a spring or other buffer upon the driving shaft of the propeller so arranged that when the propeller moving forward under the action of its rotation engages same, it takes up the direct weight of the apparatus gradually substantially as described.
5. In apparatus for aerial navigation the combination with a propeller of the type described in Claim 1 of a tube which may or may not be rifled in or at the end of which the propeller rotates when in full operation substantially as described.
6. Apparatus of the type described in Claim 1 constructed and arranged substantially as described and shown with reference to Figures 1 and 2, Figure 2<sup>a</sup>, and Figures 3 and 4 of the drawings.

Dated this 9th day of May, 1910.

J. OWDEN O'BRIEN,  
Successor to and late of W. P. Thompson & Co., of Manchester,  
Patent Agents.



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